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# VETERINARY SERVICES

ANIMAL AND PLANT HEALTH INSPECTION SERVICE  
UNITED STATES DEPARTMENT OF AGRICULTURE

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Veterinary Services nicians, other prof tasks: Keeping for those that get past economic and/or humanary biologics, and sible for preventir

ulture is APHIS--the Animal are three basic units Poultry Inspection Program,

arians, animal health tech- It has five primary , eradicating outbreaks of omestic animal diseases of safe and potent veteri- als; it is also respon- l diseases.

Disease control and eradication programs are carried out through close cooperation with State governments, the veterinary profession, and the livestock and poultry industries.

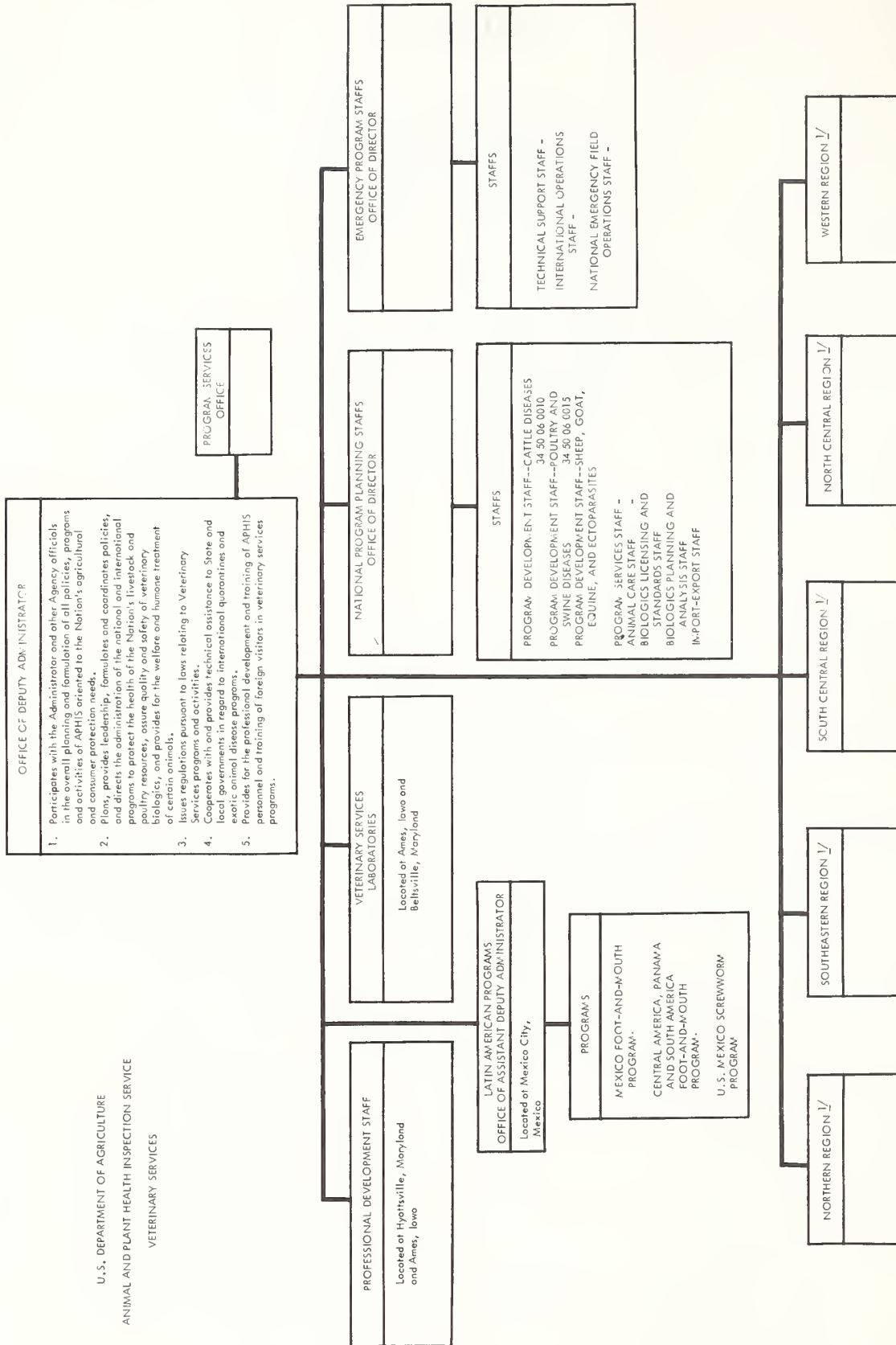
Livestock and poultry are continually threatened by diseases whose effect ranges from slight debilitation and economic loss to decimation of flocks and herds. A number of these diseases also affect man.

The best economic approach to livestock and poultry diseases is to eradicate them wherever feasible. Preventing the introduction of foreign animal diseases and eradicating those domestic diseases that are of major economic significance eliminates the need for continuous control programs and the annual costs associated with them.

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U.S. DEPARTMENT OF AGRICULTURE  
ANIMAL AND PLANT HEALTH INSPECTION SERVICE  
VETERINARY SERVICES



1/ Regional Directors located at Hyattsville, Maryland

Supersedes chart dated October 10, 1975

Prepared by Personnel Division

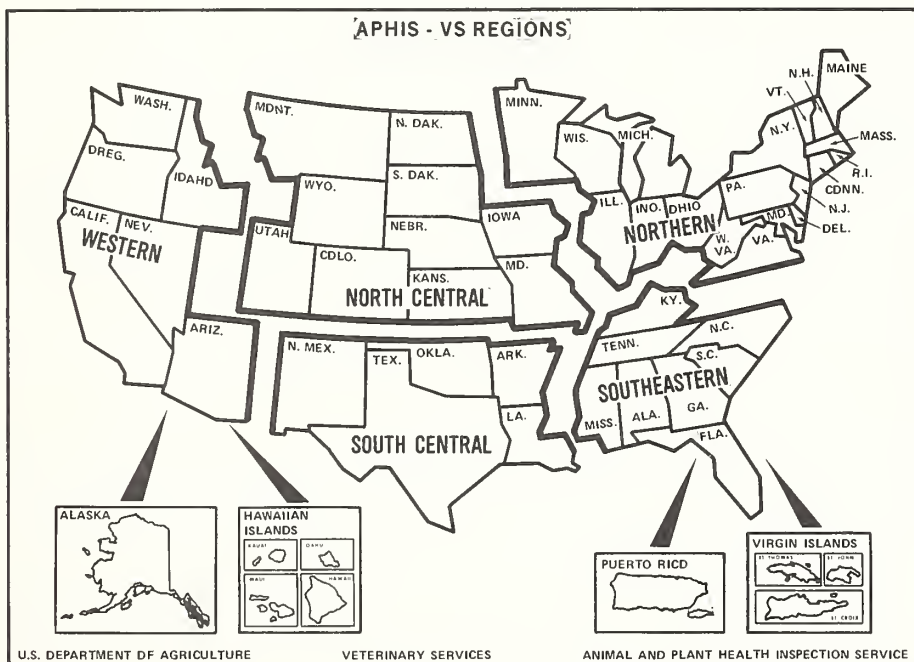
## ORGANIZATION

The Deputy Administrator of APHIS Veterinary Services (VS) participates with the APHIS Administrator and other USDA officials in developing, recommending, and carrying out programs oriented to the Nation's agriculture and consumer protection needs. The Deputy Administrator has the responsibility and authority to direct all Veterinary Services activities. There are about 2,400 permanent employees in Veterinary Services, including about 640 veterinarians.

### Field Activities

Five Regional Directors reporting to the Deputy Administrator plan, direct, and coordinate activities in their assigned group of States. They review and evaluate field program activities, recommend changes in existing policy, and represent the Deputy Administrator in contacts with industry, State, Federal and other agencies.

Reporting to each Regional Director are regional epidemiologists, regional compliance officers, regional biologics specialists, and Area Veterinarians-in-Charge. Each Area Veterinarian-in-Charge is responsible for field activities in two or more States. Reporting to the Area Veterinarian-in-Charge are District Veterinarians-in-Charge, who supervise the activities of the Veterinary Medical Officers and Animal Health Technicians under them. Usually a District Veterinarian-in-Charge is responsible for VS programs in one State, although in some instances, he will have two or more States.





## Staff and Laboratory Support

The VS National Program Planning staffs at Hyattsville, Md., provide overall leadership and control of activities concerned with the development and evaluation of on-going programs. They formulate standards, regulations, and model laws, develop methods and procedures, and provide scientific and technical support for VS programs.

The VS Emergency Programs staffs develop and maintain methods to control and eradicate emergency outbreaks of animal diseases. They maintain an awareness of the incidence of foreign animal diseases throughout the world and provide the technical capability to control such diseases should they enter this country.

The Professional Development staff participates in the planning, formulation, and evaluation of all training policies, programs and educational activities. It identifies and evaluates VS staff training needs; and plans, develops, and administers training programs in veterinary medicine and related fields. In addition, the staff provides for training of foreign visitors and administers the veterinary accreditation program. The staff also maintains liaison with veterinary institutions and participates in the development of agency-wide policies and programs.

The Veterinary Services Laboratories (VSL) at Ames, IA, and Beltsville, MD, provide laboratory support for the veterinary biologics program, import-export testing, and the various disease control and eradication programs. Veterinary virologists, pathologists, bacteriologists, parasitologists, toxicologists, and chemists are used in this support activity.

## Other Program Activities

The Assistant Deputy Administrator for Latin American Programs has the responsibility for (1) cooperative surveillance programs for foot-and-mouth disease (FMD) with Mexico, Central America, Panama, and South America, and (2) the U.S.-Mexico Screwworm Eradication Program.

The Executive Officer provides planning, development, implementation, and appraisal of management policies and programs. He directs administrative management operations in headquarters and coordinates such activities in field offices. He arranges for or provides procurement and supply services, personal and real property management, personnel services, and budget and fiscal services at the VS level.

The Executive Officer maintains liaison with all agency management segments concerning administrative management and services. He provides developmental activities and support services in a variety of administrative program areas and directs administrative review of field operations for adequacy and compliance.

Information support for all VS activities and programs is provided through the Veterinary Services Programs Branch of the APHIS Information Division.



## DOMESTIC PROGRAMS

### Animal Care

The purpose of the original 1966 Laboratory Animal Welfare Act was to protect the owners of dogs and cats from theft of their pets, to prevent the sale or use of stolen dogs and cats for research purposes, and to provide humane care and treatment for dogs and cats and certain other animals until they actually passed through the doors of a research laboratory to be used for research purposes.

The Act was amended in 1970 to include all warmblooded animals and to provide authority to regulate the care and treatment of animals during research, including the use of pain killing drugs during experimentation. The Act was further amended in 1976 to provide the Department with the authority to regulate animals covered by the Act during transportation by common carriers, and to prohibit animal fighting ventures such as cockfighting and dogfighting.

The types of animal-related industries subject to the Act now includes zoos, circuses, roadside parks exhibiting animals, wholesale dog breeders and brokers, retail pet stores selling exotic animals, and common carriers transporting live animals.

Minimum standards for humane care and treatment of animals have been established for animal dealers, research facilities, and exhibitors. These standards contain general and specific requirements relating to housing, feeding, watering, sanitation, ventilation, separation by species, shelter from extremes of weather, handling, and adequate veterinary care. Standards for marine mammals, exercise for caged animals used in research, and for the air transportation of animals are currently being processed.

Unannounced and unscheduled inspections are conducted by VS inspectors to ensure compliance with established standards and regulations. The Department's responsibilities and workload have increased dramatically during the 10-year history of the animal welfare program. During the first year of the program, 34 animal dealers and 113 research facilities were licensed and inspected; no actions were taken against violators. During FY 1976, over 5,500 animal dealers and over 950 research facilities were licensed and inspected, and 62 actions were initiated against violators.

The Animal Welfare Program is strictly a Federal program carried out in cooperation with other Federal agencies.

The purpose of the Horse Protection Act is to stop the cruel and inhumane practice of "soring" the feet or limbs of horses through the infliction of pain and/or inflammation. The "soreness" causes the horse to lift its front feet very high, producing an exaggerated gait. Subsequently, the horse reaches further with its hind legs, in order to take weight off its painful front legs and the resulting high stepping, far-reaching motion is known in horse circles as the "big lick."

The original 1970 Horse Protection Act was amended in 1976 to strengthen enforcement authorities and increase funding. Regulations under the Act make it unlawful for any person to transport, exhibit or sell a sore horse, or to conduct a horse show or sale in which sore horses are exhibited or sold. Violators are prosecuted criminally in Federal District or Magistrates Court, and civilly through Department administrative procedures.

## Cattle Diseases

Large-scale cooperative programs with the States are underway for the eradication of brucellosis and tuberculosis. Limited field and laboratory activities are carried out on bovine leukosis, anthrax, mastitis, cysticercosis, and anaplasmosis. Information on other endemic bovine diseases is also acquired and disseminated by the cattle diseases staff.

### Brucellosis

Brucellosis is a contagious disease of animals transmissible to man. The disease is known as contagious abortion or Bang's disease in livestock. In man it is known as undulant fever or Malta fever. Brucellosis in cattle is characterized by abortion and infertility.

The cooperative State and Federal brucellosis eradication program was initiated in 1934 as a test-and-slaughter program and was part of the cattle reduction effort in the drought years. Participation of the States in the program was on a voluntary basis, with some States participating at a much higher level than others. Calfhood vaccinations with Strain 19 was added to the program in 1940.

The incidence of the disease was significantly lowered during these initial years, and in 1954, the level of the effort was accelerated. Stepped-up measures included area testing and adoption of population surveillance programs, including the brucellosis ring test (BRT) and the market cattle testing program. Calfhood vaccination was continued at a high level in many States.

Provisions were adopted for areas to attain modified certified status when no more than 1 percent of the cattle or 5 percent of the herds are infected with brucellosis. Certified free status is obtained when no infected herds are known to exist in an area after the population has been screened for evidence of disease and, during the 18 months preceding certification, no more than 0.2 percent of the cattle nor more than 1 percent of the herds were found to be infected.

The present program works as follows: Infected herds are located through a surveillance system consisting of the milk ring test, the market cattle testing program, and epidemiological tracing of the disease. Infected herds are quarantined, with test and slaughter of reactors until the herds have passed at least two clean tests: The first is at least 30 days after the last reactor was destroyed and the second is at least 90 days after the first negative test. In some cases, herd depopulation is utilized. Calfhood vaccination with Strain 19 is stressed in areas of higher infection.

The infection rate in cattle in those herds tested at the time the brucellosis eradication program began in the 1930's was over 11 percent. By the late 1940's, an estimated 5 percent of the cattle in the United States were infected. Today, less than 1 percent of the cattle are infected, and 90 percent of that infection is concentrated in 11 southeastern and south central States. Annual losses from lowered milk production, aborted calves, and reduced breeding efficiency have been reduced from about \$100 million in 1949 to about \$30.5 million today. The 328 cases of undulant fever in man reported in 1975 is a mere fraction of the 6 400 cases reported in 1947.

Operating concurrently with the bovine brucellosis program is one to eradicate brucellosis from the Nation's swine population. The disease in swine, although caused by a different species of brucella, exhibits most of the signs seen in infected cattle, plus such additional ones as arthritis and abscesses.

The swine program depends primarily on slaughter surveillance to locate infected herds. These herds are then freed of the disease by testing breeding animals and slaughtering reactors, or by marketing the entire herd and restocking with healthy swine. Areas that successfully carry out the prescribed procedures for locating disease and which have eliminated all known foci of infection are designated as "validated brucellosis free."

The infection rate in swine is quite low, with slightly more than 0.1 percent of those tested in 1976 classified as reactors. Despite this low rate, swine continue to be a major source of undulant fever in man, particularly among those employed in the meat packing industry.

### Tuberculosis

Bovine tuberculosis, a chronic disease caused by Mycobacterium bovis, affect many warmblooded animals. Cattle and swine are the farm animals most often affected.

The bovine tuberculosis eradication program started in 1917 as a test-and-slaughter program. Today, the program is carried out through more sophisticated techniques. A nationwide surveillance program detects lesions indicative of tuberculosis when cattle are slaughtered. Tuberculous cattle are traced to their originating herd, which is then tuberculin tested.

All tuberculin reactor cattle are destroyed and their owner is indemnified by State and Federal agencies. Tuberculous herds are quarantined and tested until all animals are negative on three consecutive tests at specified intervals: or the entire herd is slaughtered with indemnity. Sales and purchases from tuberculosis-infected herds are traced to their originating herd and those animals are tuberculin tested.

In addition to the surveillance program, cattle are tuberculin tested to satisfy requirements for export, milk ordinance, sale or show, interstate movements, artificial insemination, and qualification as TB-accredited herds.

As a result of the program there has been a major reduction in condemnation of carcasses and parts at the time of slaughter. The reactor rate in cattle has

been reduced from 4.38 percent in 1918 to 0.08 percent in 1976. Human tuberculosis caused by Mycobacterium bovis is practically nonexistent.

Swine tuberculosis is caused by the Mycobacterium avium complex. It results in rather heavy financial losses in some sections of the country because swine carcasses affected with this condition must be cooked or condemned at slaughter establishments. There is, at present, no national control or eradication program for swine tuberculosis. Some individual States do, however, have such programs.

### Anaplasmosis

Anaplasmosis is a parasitic blood disease of cattle which is spread by insects, ticks, and man through contaminated syringes and other equipment. Annual losses are estimated at \$100 million.

Identified in the United States as early as 1927, it has been found in many areas of the country, with the greatest incidence in the southcentral and western regions. An extensive survey conducted in 1973 revealed that 12 States have an infection rate of 10 percent or more in their mature cattle. The balance of the States had lower rates, approaching zero in some cases.

At present, there is no national program for the control or eradication of the disease. However, States are encouraged to carry on testing programs for the disease and to use chemotherapy to eliminate the carrier status of cattle. There are two tests used for the diagnosis of anaplasmosis: The complement fixation and the card test. The card test is particularly effective because it is easily administered in the field.

Federal regulations restrict the movement of animals infected with or exposed to anaplasmosis.

### Mastitis

Mastitis affects all animals, particularly dairy cattle. Unwholesome udder secretions of diseased animals in the public milk supply is regarded as an adulterated food problem. Mastitis abatement programs are now underway in some States, although there is no nationwide program.

## Swine and Poultry Diseases

Programs to control and eradicate various diseases of swine and poultry are coordinated by the swine and poultry diseases staff. The staff also keeps abreast of research nationally and internationally on diseases of swine and poultry that are important from an economic or public health viewpoint.

### Hog Cholera

Hog cholera is an infectious, contagious viral disease that affects swine only. The disease can cause high death losses; however, in some cases, it can appear in a chronic form with lower death losses over an extended period.



Hog cholera was first recognized in the United States in the 1830's and is believed to have originated in this country. It has since spread throughout the world. To date, Canada, New Zealand, England, Norway, Australia, and Sweden have conducted successful eradication programs.

Before the U.S. eradication program began in 1962, hog cholera cost the swine industry \$50 million annually. Approximately \$40 million of this was the producer's cost of protection through vaccination, with the remainder due to death losses in the estimated 5,000 to 6,000 swine herds affected annually.

The cooperative State-Federal eradication program is based on (1) finding the disease through the establishment of a valid reporting system, (2) containing it through State and Federal quarantines on areas where infection is confirmed, and (3) elimination of the virus through destruction of infected and exposed swine herds, with indemnity payments to help compensate swine owners for losses. In 1969, the interstate shipment of hog cholera vaccines was outlawed. In 1972, a National Emergency was declared to deal with an upsurge of the disease in the Southeast and Midwest.

Efforts under the National Emergency were highly successful. During 1973, only 16 outbreaks occurred--all during the first half of the year. In 1974, only two outbreaks occurred; in 1975, one. The disease appeared again in early 1976 in New Jersey and New England.

Today, hog cholera is believed to have been eradicated in the United States. However, all areas of risk are being monitored intensively for new or previously undisclosed infection. Each outbreak is handled on an emergency basis in order to trace the source of infection and stamp out the disease as quickly as possible.

### Trichinosis

Trichinosis is a parasitic disease of swine and other meat-eating warmblooded animals. Humans can get the disease by eating raw or undercooked meat from infected animals.

Trichinosis can spread through feeding uncooked infected meat and garbage to swine. Current control efforts are aimed at protecting consumers by requiring that all commercial garbage fed to swine be cooked. Meat inspection regulations require that all pork to be eaten raw must be specially processed before leaving the packing plant.

Trichinosis is at an all-time low now. Studies in the 1960's showed an infection rate of 0.12 percent in grain-fed hogs and 0.5 percent in garbage-fed hogs. About 1.5 percent of the swine in the United States are garbage-fed.

There is no national program against trichinosis in swine.

### Exotic Newcastle Disease Surveillance

Exotic Newcastle disease or velogenic viscerotropic Newcastle disease (VVND) is a contagious and deadly virus disease affecting all species of birds. The

disease causes bleeding in the intestines and reproductive glands, along with severe diarrhea. In commercial poultry operations, it kills many of the birds it affects, shortens the lives of others and cuts egg production.

Except for sporadic outbreaks which were quickly eliminated, the United States remained free of this disease until late 1971, when a serious outbreak occurred in southern California. It took nearly 2 years and the destruction of nearly 12 million birds (mostly laying hens) at a cost of \$56 million before the disease was eradicated.

The disease is still widely distributed throughout the world, so a constant alert must be maintained in order to rapidly detect and diagnose any introductions, and to prevent dissemination of the disease into domestic poultry flocks.

A vital part of the surveillance program is the effort by VS to increase awareness of exotic Newcastle disease on the part of poultrymen, diagnostic laboratories, and all other segments of the industry. Experienced VS diagnosticians and epidemiologists help investigate suspicious cases of exotic Newcastle disease or other foreign poultry diseases. The surveillance has been successful as an early warning system for exotic Newcastle disease; two small outbreaks were detected and quickly eliminated in 1975.

Although VVND has been eliminated from the mainland United States, it continues to exist in Puerto Rico where a quarantine against birds and poultry products remains in effect.

#### Duck Virus Enteritis

Duck Virus Enteritis (DVE) is a contagious disease of waterfowl that causes internal bleeding and severe diarrhea and kills many infected birds.

Before 1967, when it broke out on Long Island, this disease was unknown in the United States. Prompt enforcement of control measures confined the disease and the outbreak was officially declared eradicated in 1970.

However, sporadic outbreaks in small aviculturists flocks have occurred since then. In 1973, a serious outbreak occurred in migratory waterfowl, resulting in the development of a "duck plague contingency plan" by the U.S. Department of the Interior. Veterinary Services will furnish technical assistance and laboratory backup in the event of a severe outbreak.

#### Ornithosis

In the United States, agricultural losses attributed to ornithosis reached a peak from 1954 through 1956, when mortality and meat and egg condemnations in turkeys approached \$500,000 annually. Public health interest was aroused because the disease appeared in humans who worked with the infected turkeys.

Between May 6 and June 25, 1974, there were 102 cases of sickness and one death from ornithosis in slaughter plant employees and poultry inspectors in three States. The disease was traced to turkey flocks originating in Texas.

A program was started in Texas to detect infected flocks and to treat turkeys before they were brought to slaughter, in order to protect plant workers and inspectors. Under this program, all flocks have to be inspected, blood tested, and certified free of ornithosis before birds go to slaughter. If a flock is diseased, an antibiotic is administered to the turkeys for 21 days and they are retested before they are marketed. No slaughter plant workers had suffered from ornithosis in the first 2 years of this program until the disease was discovered in plant workers in a Gibbon, Nebraska, processing plant in June 1976. This infection resulted from exposure to a spent turkey breeder flock shipped from Texas. No other cases have occurred. Beginning January 1, 1977, this program is being administered by APHIS' Meat and Poultry Inspection Programs.

### Avian Leukosis

In 1972, Avian Leukosis or Marek's Disease was the cause of 40 percent of the condemnations in broilers at the time of slaughter. The advent of Marek's Disease vaccine has reduced these condemnations significantly. Veterinary Services participates in field studies to improve the effectiveness of the vaccine by its proper use and better flock management practices.

### Avian Mycoplasma

All poultry primary and multiplier breeders have programs for the control and eradication of Avian Mycoplasma. Veterinary Services provides technical assistance through trained poultry specialists when specific problems arise.

### Pullorum and Fowl Typhoid

Veterinary Services participates in a cooperative State-Federal eradication program for pullorum disease and fowl typhoid in turkeys. Five important turkey-raising States are participating in this program. The national Poultry Improvement Plan conducts a control program for individual flocks.

### Salmonellosis

Veterinary Services participates in field studies aimed at reducing salmonella contamination in animal feeds. Further research is being done to find methods to produce breeding turkeys free of salmonella infection.

## Sheep, Goat and Equine Diseases and Ectoparasites

The sheep, goat, equine and ectoparasite staff plans, recommends, and develops VS policy for immediate and long-range national programs designed to control and eradicate specified sheep, goat, and equine diseases, and certain external parasitic infestations in these and other species. Major VS programs in these areas are listed below. The staff also is involved to a lesser extent with bluetongue of sheep and cattle; foot rot of sheep; ram epididymitis; cattle grubs; arthropod-borne encephalitides of equidae; and miscellaneous ectoparasites.

In addition, the staff develops technical data on dipping and spraying facilities and techniques and evaluates and recommends pesticides for listing as USDA-permitted pesticides.



## Scrapie

Scrapie is a naturally occurring disease of sheep and goats caused by a transmissible, filterable and self-replicating agent which is considered to be a virus with unusual characteristics. The disease causes a progressive degeneration of the central nervous system, which in turn causes the animal to rub, scratch, and become debilitated and incoordinated.

Scrapie was first reported in Canada in 1938, and in the United States in Michigan 1947. As of February 1976, the disease had been diagnosed in 31 States and has affected sheep of the Cheviot, Hampshire, Montadale, and Suffolk breeds.

The cooperative State-Federal scrapie eradication program began in California in 1952. The program currently provides for (1) laboratory diagnosis of the disease, (2) quarantine of infected flocks, (3) tracing of exposed and bloodline animals, (4) slaughter and destruction of infected and source flocks, bloodline animals, and exposed animals, and (5) payment of indemnity for animals slaughtered because of scrapie.

In addition, a field trial is being carried out at Mission, Texas, to study natural scrapie. To date, this trial has showed that succeeding generations from scrapie-infected animals will develop the disease and that scrapie will spread to nonrelated sheep and goats held and bred on infected premises.

USDA is also concerned about the similarity of scrapie to two diseases of man--kuru and Creutzfeldt-Jakob disease--and to the recent transmission of these diseases to five common primate hosts--rhesus, capuchin, cynomolgus, spider, and squirrel monkeys--with production of very similar clinical signs and lesions in the brain. Although there is no proof that these diseases are caused by the same agent, USDA can no longer permit scrapie infected or exposed sheep and goats to be processed for human or animal food.

## Equine Infectious Anemia

Equine Infectious Anemia (EIA) or swamp fever is an infectious virus disease of horses, mules, and asses that produces anemia, intermittent fever, and severe loss of weight. EIA may kill from 30 to 70 percent of animals infected. The virus that causes the disease remains in the blood of animals that recover, making them lifelong carriers of EIA. These carriers usually show no signs of the disease. Horses with EIA cannot be cured.

EIA has been reported in all sections of the United States. In FY 1976, 10,076 positive reactions were found among 790,107 tests for EIA.

The development of a practical aid to diagnosis--known as the Coggins test--has placed new emphasis on the disease. Control and/or eradication of EIA is now possible through application of the Coggins test and quarantine and disposal of infected animals.

In 1973, USDA amended Federal regulations to prohibit the interstate movement of horses reacting to the Coggins test. Veterinary Services administers a

national laboratory approval system for laboratories performing the Coggins test, with over 100 laboratories currently approved.

Since 1973, 40 States have initiated regulatory actions relating to EIA, either requiring a negative test prior to entry movement within the State. Nearly all States quarantine horses reacting to the Coggins test; a number of these States require the slaughter of infected animals.

### Equine Piroplasmosis

Equine Piroplasmosis (EP) is a tick-borne disease caused by two blood parasites (Babesia caballi and Babesia equi) and is clinically indistinguishable from Equine Infectious Anemia (EIA). EP was first reported in the United States in Florida in 1962. It has since been found to be endemic in southern Florida, Puerto Rico, and the U.S. Virgin Islands. Dermacentor nitens, the tropical horse tick, is the principal vector of the disease.

Florida carries out a control program in the southern part of the State, based on diagnosis with the compliment-fixation test, spraying to control the tropical horse tick, and tracing of sources of infection.

### Venezuelan Equine Encephalitis Surveillance

Venezuelan Equine Encephalitis (VEE) or horse sleeping sickness is a virus disease carried by mosquitos and other blood-sucking pests. VEE is fatal to about 60 percent of all horses, mules, and other equidae infected. In horses, the disease is characterized by high fever, drowsiness, and stumbling and staggering movements. Other warmblooded animals, including humans, are subject to low-grade infection. VEE is rarely fatal to man.

VEE invaded the United States in the summer of 1971, crossing the U.S.-Mexico border into southern Texas. A National Emergency was declared. The disease was confirmed in 26 south Texas counties, killing hundreds of horses and hospitalizing many people. The outbreak was brought under control through an eradication program involving quarantines, mass vaccination of horses, and spraying for mosquitos and other vectors. The last case was confirmed on November 7, 1971, in Starr County, Texas.

Since then, VS has carried out an extensive surveillance program to detect the VEE virus. This involves investigation of cases of equine encephalitis, collection and testing of serum samples from wild and domestic animals in the Southern United States, and collection and virus isolation attempts from mosquitos along the U.S.-Mexico border and the Gulf Coast. VS also promotes vaccination of horses against Eastern, Western, and Venezuelan Equine Encephalitis, and maintains close liaison with public health services and animal health officials of Mexico.

### Cattle Fever Ticks

Cattle fever ticks spread bovine piroplasmosis, a severe and often fatal disease of cattle. Caused by a blood parasite that destroys red blood cells, the disease is often called cattle tick fever or Texas fever.

For almost 150 years, much of the Southern and Southwestern United States was infested with cattle fever ticks (Boophilus annulatus and Boophilus microplus). Cattle tick fever caused great losses to cattlemen each year. In 1906, when a nationwide eradication program began, the disease was taking a \$40 million annual toll. Today, that loss would be an estimated \$1 billion a year.

Cattle fever ticks were eradicated from the United States in 1943 after a 37-year eradication campaign. Today's program consists of maintaining a permanent quarantine zone which extends 500 miles along the Rio Grande River from the Amistad Dam near Del Rio, Texas, to the Gulf of Mexico. Bi-weekly inspection of livestock within this buffer zone serves as a barrier against strays from Mexico that might be carrying ticks.

All cattle and horses leaving the quarantine zone must be inspected. If free of ticks, they are given a precautionary dipping and then allowed to leave the quarantine zone. Infestations found are eradicated by systematic dipping of cattle and horses on the infested premises for a period of 5 to 9 months. Occasionally infestations are found outside the quarantine zone. This is usually due to strays, smuggled animals, or movement of infested animals. The same procedure of systematic dipping is followed.

### Cattle Scabies

Psoroptic cattle scabies is caused by tiny parasitic mites that puncture the skin of cattle and feed on the body fluids released from the wounds. These fluids dry and form scabs. As mites increase in number, an infested animal's hair will fall out and the lesions which are formed can eventually cover much of the body with thick, crusty scabs--hence the name, scabies. Heavy infestations can, in some cases, cause death.

Scabies does not effect the wholesomeness of meat from infested cattle but the intense itching caused by the mites produces loss of appetite and lowered gains and feed efficiency. Economic losses, particularly in feedlots, can be severe.

Cattle scabies was prevalent in the Western States in the early part of this century. Although eradication efforts have eliminated the disease from large sections of the United States, outbreaks still occur in the Southwestern, Western, and Midwestern States. Occasionally, outbreaks occur elsewhere.

A cooperative program to eradicate cattle scabies is carried out by VS in cooperation with the States. The program involves State quarantines of infected lots or herds, with Federal area quarantines to support these actions as necessary. Infected and exposed cattle are treated with pesticides to kill the scabies mites. Each outbreak is investigated to determine the origin of the infestation and any possible spread. VS also maintains a parasite laboratory for positive identification of each reported case. A chemical laboratory helps insure that proper chemical concentrations are used when cattle are dipped.

### Screwworms

Screwworms, the larvae or maggots of the screwworm fly (Cochliomyia hominivorax), attack all warmblooded animals, including humans, wildlife, and pets.



The worms feed on healthy flesh in open wounds, unlike blowfly maggots which feed only on dead or diseased tissue. If left untreated, multiple screwworm infestations can kill a full-grown steer in 10 days.

Before eradication efforts began, screwworm infestations cost livestock producers \$20 million a year in the Southeast and about \$100 million a year in the Southwest. Losses from screwworms in Puerto Rico often exceeded \$2 million a year.

The screwworm eradication program is built around the mass rearing and release of millions of sexually sterilized screwworm flies. Native fertile flies that mate with sterile males lay eggs that do not hatch. Thus, screwworm populations drop with each generation until eradication is achieved.

Screwworms were eradicated from the Southeastern United States in 1958-59. In 1962, an eradication program began in the Southwest and by 1966, overwintering populations of screwworms had been eradicated. However, because of yearly reinfestations from Mexico, a barrier of sterile screwworm flies dropped along the U.S.-Mexico border helps protect U.S. livestock. To eliminate these yearly invasions, in 1972 USDA and its counterpart agency in Mexico agreed to a joint program to eradicate screwworms from most of Mexico and establish a barrier zone across the 125-mile-wide Isthmus of Tehuantepec in Southern Mexico. Funding for this program is shared with Mexico on an 80-20 basis. In 1976, the new Mexican sterile fly factory at Tuxtla Gutierrez was dedicated. Flies from this facility and the U.S. fly factory at Mission, Texas will be used in the eradication program in Mexico.

Screwworms were eradicated from Puerto Rico and the U.S. and British Virgin Islands in 1975.

### Interstate Regulations

Federal regulations are developed and issued in support of VS disease eradication and animal welfare programs under the provisions of several animal quarantine and human laws. These regulations govern interstate movement, importation, exportation, and the humane handling of animals. They also provide requirements which govern the payment of indemnities to owners for animals and materials destroyed in order to eradicate diseases. The VS program services staff is responsible for coordinating animal health needs with existing legal authority.

Regulations are enforced by monitoring livestock movements, coordinating investigative activities, providing necessary training for compliance personnel, and maintaining liaison with USDA's Office of General Counsel. Violators are prosecuted in the U.S. district courts.

Interstate inspection activities of VS involves the monitoring of over 2,000 livestock concentration points for compliance with market standards and interstate regulations. Market standards for sanitation and health inspection are developed by the program services staff and this staff administers a system of specific approval of markets complying with the standards.

## Identification

Identification is a key part of most VS disease eradication and control programs. A number of animal identification devices and methods--including plastic and metal eartags, hot iron and freeze brands, backtags, and tattoos--are employed to identify livestock in trade channels in such a manner that they can be traced back to their farm or ranch of origin.

Uniform coded eartags and backtags are supplied by VS officials and constitute the principal identification devices used in a national Market Cattle Identification (MCI) program. A similar Market Swine Identification (MSI) program employs eartags and tattoos. These identification systems make it possible to conduct extensive screening programs at livestock concentration points to locate foci of infection in the brucellosis and tuberculosis eradication programs and to determine other disease incidence rates.

## Veterinary Biologics

VS administers the Virus-Serum-Toxin Act of 1913 which requires that vaccines, bacterins, antitoxins and similar veterinary biological products be safe, pure, potent, and effective whenever they are shipped across State lines. Federal regulations have been developed and are revised periodically to assure that veterinary biologics meet these standards.

Two VS staffs--biologics licensing and standards and biologics planning and analysis--are responsible for establishing policy and for implementing the provisions of this program. Veterinary biologics are regulated primarily through the issuance of Federal licenses and by a system of inspections, investigations, and testing.

The licensing and standards staff issues licenses for each producing establishment and for each biological product. License conditions cover virtually every aspect of plant operations, production and testing. The staff reviews product labels to make sure that proper instructions are included, that necessary precautions are stated, and that no misleading or false claims are advanced. The staff also reviews the regulations for necessary revisions, additions or deletions, and establishes standards for testing and production.

The planning and analysis staff has overall responsibility for establishing priorities and procedures for inspections and investigations, including sampling rates for product testing, and for handling consumer complaints. When conditions warrant, the staff may recommend recall or stop sale order for product serials. The staff also develops training programs.

VS biologics specialists and compliance officers in the field inspect production plants and investigate violations of regulations and license provisions.

The work of the two staffs and the field force is backed up by the testing of product samples at the Veterinary Services Laboratories (VSL), which also develop standard testing procedures and assay methods.

## Veterinary Services Laboratories

The Veterinary Services Laboratories (VSL) are located at Ames, Iowa, and Beltsville, Md. VSL's mission includes providing laboratory support for veterinary biologics, import-export testing, and for disease eradication and control programs.

Support for biologics involves testing commercially produced biologicals selected on a random basis, development of new test methods, improvement of existing methods, and the production of reagents for VSL and industry to use in test systems.

Disease eradication and control programs activity involves providing diagnostic laboratory support on diseases such as tuberculosis, brucellosis, EIA, hog cholera, etc. Also, the laboratory furnishes import-export testing and general diagnostic assistance to the VS field force. VSL maintains a readiness in case of an outbreak of exotic disease. Diagnostic reagents are produced where they are not available commercially. VSL helps train VS field force and State laboratory personnel.

VSL also develops and maintains diagnostic reference assistance and consultation services for VS field stations, State diagnostic laboratories, university research personnel, and foreign scientists.

### Export

To assure that the United States exports only healthy poultry and livestock, VS requires animals to be examined and certified free of communicable diseases before they are shipped to foreign nations. Examinations and tests--usually done by accredited veterinarians--include both the U.S. export health requirements and the frequently complex import requirements of the receiving nation. A VS veterinarian endorses export health certificates after all tests and other requirements have been met; however, a final examination is conducted by a VS veterinarian at the port of export before the livestock or poultry leave the country.

The VS import-export staff develops standards and regulations for humane handling of exported animals, and prescribes the facilities that must be provided at ports of export. Certain animal byproducts are inspected and certified on a reimbursable basis when requested.

## PROTECTING U.S. LIVESTOCK FROM FOREIGN ANIMAL DISEASES

Existing import regulations, covering items from hides to live animals, have done an exceptional job in protecting American livestock from foreign animal diseases. But the destructive outbreaks in 1971 of Venezuelan Equine Encephalitis (VEE) in south Texas and exotic Newcastle disease in southern California emphasized the danger posed to the United States by foreign diseases of livestock and poultry. Animals in our national herds and flocks have no



natural defenses against foreign diseases such as foot-and-mouth disease and African swine fever and, if they gained a foothold in this country, they could cripple livestock and poultry production.

### Import Animals, Birds and Products

Strict regulations on the import of animals and products that could spread disease is the first line of defense against foreign animal diseases. The VS import-export staff continually reviews and evaluates research work concerning processing of animal products and associated materials, new tests for disease, procedures for precautionary treatment of animals and birds, and studies relating to disease trends in foreign countries. The staff recommends appropriate changes in import regulations, alterations in the procedures used at ports of entry, and guidelines for the inspection and approval of destination establishments or processing procedures.

The import-export staff also issues prior import permits to prospective importers and monitors overseas as well as U.S. port of entry inspections and quarantines, certifications, tests, and precautionary treatments of certain animals, animal semen, and birds, as well as meat, and other animal and poultry products. Certificates of purebreeding are issued by the staff for duty-free entry of purebred livestock if they are of a breed listed in the Code of Federal Regulations.

Control is maintained over the importation and domestic movement of infectious organisms and their vectors to make sure that such movements do not constitute a threat to the livestock industry. Many laboratories in the United States conduct research on the cause and spread of animal diseases and scientists often want to import organisms and vectors from foreign countries or obtain them from other U.S. laboratories. VS regulations require that all such imports and many of the interstate movements be covered by a VS permit. The import-export staff reviews and approves applications for permits, with emphasis on the relative danger of the organisms and the security of the research facility to prevent their escape.

### Animal Import Centers

VS operates three animal import centers: Two smaller ones at Miami, Florida, and Honolulu, Hawaii, and a larger center at Clifton, New Jersey. The Clifton import center is to be replaced by a newer and more modern facility at Stewart Airport near Newburgh, New York. Scheduled for completion in 1979, the Newburgh Animal Import Center will almost triple the present capacity at Clifton and will permit the annual importation of up to 800 horses, 300 zoo animals, 1,800 cattle, and 4,000 poultry. Construction of two new barns at the Honolulu center will increase capacity there from 6 to 23 stalls.

Commercial shipments of birds are imported through any VS animal import center or through privately owned bird quarantine stations approved to operate under VS supervision. Currently, there are 34 privately owned bird quarantine stations throughout the United States.



Permits for the importation of animals and birds through import centers and privately owned bird quarantine stations are issued by the import-export staff.

A new off-shore maximum-security animal import center at Fleming Key, Fla., is expected to be operational by late 1978. The facility will initially provide quarantine services for cattle imported directly from Europe. This will be the first such importation since 1930, when ruminants and swine were prohibited entry from any country where foot-and-mouth disease or rinderpest exists. The station should accommodate 400 cattle for each of two 5-month quarantine periods per year.

### Port Inspection

Persons and baggage entering the United States from foreign countries are checked for prohibited agricultural materials--both plant and animal--at U.S. ports of entry by personnel from the APHIS Plant Protection and Quarantine Programs (PPQ).

U.S. port of entry inspection of animal products and byproducts is also the responsibility of PPQ.

Certain agricultural materials from foreign countries are permitted entry under restriction. VS has approved over 200 processing plants in the United States for the receipt and handling of a wide variety of restricted animal products, byproducts, and related materials. These establishments are under continuing surveillance to insure that the restricted imports do not constitute a disease risk for livestock populations.

### Emergency Disease Outbreaks

Emergency Programs was established to increase VS capability to control and eradicate outbreaks of disease which pose a serious threat to livestock and poultry. This involves diseases exotic to the United States and those domestic diseases for which the Secretary of Agriculture declares a national emergency. The Emergency Programs organization within VS maintains an awareness of animal diseases in the world in order to develop standby programs to combat possible outbreaks in the United States. It also maintains the technical capacity and competency to support the control and eradication of these diseases. To maintain the ability to respond immediately and effectively to an emergency disease situation, Emergency Programs has three sections: international operations, technical support, and national emergency field operations.

#### International Operations

The international operations staff monitors the worldwide animal disease situation. These activities are divided into eastern and western hemispheric units. The eastern unit is involved with livestock and poultry diseases and programs to combat them in European, African, and Middle Eastern countries.

In addition, this unit coordinates relationships with international multi-agency organizations and arranges for U.S. personnel to be assigned to various international posts for training in the several diseases exotic to the United States.

The western hemispheric unit is responsible for cooperative programs in Mexico, Central America, and Panama designed to detect and combat foot-and-mouth disease, rinderpest, and other foreign animal diseases. In addition, this unit works with Colombia and Panama on programs to protect against the spread of foot-and-mouth disease northward across the Darien Gap. This is a 250-mile stretch of dense jungle and swamps between the two countries which is scheduled to be spanned by the Pan American Highway.

The international operations staff also represents USDA in the development of agreements with other U.S. and foreign government agencies, international agencies, and foundations in the field of animal health.

### Technical Support

The technical support staff provides the technical and scientific resources needed in the operation of Emergency Programs. It is responsible for developing and maintaining Emergency Program's highly sophisticated information retrieval system. This system includes (1) a search of the world's literature in the fields of interest to Emergency Programs; (2) reading, indexing, and coding relevant articles; and (3) transferring these articles to microfilm for storage and rapid retrieval. In response to program needs or user requests, stored information--including maps--at the Emergency Programs Information Center (EPIC) in Hyattsville, Maryland, can be rapidly retrieved and disseminated.

The Technical Support staff also maintains liaison with all pertinent agencies, organizations, and individuals in order to be better prepared for any disease emergency. Through this cooperation, the staff maintains a continuing familiarity with new developments in related fields. It also utilizes the services of specialists from these cooperating agencies in the preparation and execution of emergency plans.

A laboratory specialist maintains close working relations with animal disease research and regulatory laboratories throughout the United States and abroad. Diagnostic procedures are selected for confirmation of all foreign animal diseases. Personnel from Federal, State, university, and military laboratories are selected and trained to conduct the specific diagnostic tests required.

A special group of entomologists coordinated by the staff entomologist evaluates the importance of insects in the transmission of animal diseases and develops plans for their control. During actual emergency operations, these entomologists assist in establishing vector control capabilities as a part of the national effort in the field.

### National Emergency Field Operations

The national emergency field operations staff coordinates an intensive animal disease surveillance program that is aimed at rapidly detecting and diagnosing

any exotic disease outbreak that occurs in this country. Specially trained foreign animal disease diagnosticians stationed throughout the United States immediately investigate each suspected foreign animal disease and submit specimens to the appropriate laboratory.

To carry out field operations when an emergency disease situation arises, a Regional Emergency Animal Disease Eradication Organization (READEO) has been set up in each of the five VS regions. The READEO's were established on the theory that a preselected, pretrained unit of specialists can eradicate a disease more rapidly and efficiently than a group pulled together at the time a disease outbreak occurs.

Federal, State, university, military and other sources have been tapped to fill key positions in the READEO's. These people are given training in their specific responsibilities and are prepared to respond quickly when an outbreak occurs. When a READEO is activated, a task force is set up under the direction of the VS Regional Director or Assistant Regional Director, who is relieved of his regular duties. The State Veterinarian(s) of the affected State(s) usually serves as co-director(s) of the task force. The task force director is responsible to the chief of the national emergency field operations staff, who in turn reports through the Director of Emergency Programs to the VS Deputy Administrator.

The staff maintains an epidemiological capability for various foreign animal diseases. During an emergency, the staff is responsible for coordinating, developing, and using epidemiology in the control or eradication efforts. The staff also develops contingency plans for resources needed in an emergency and constantly updates these plans.

## LATIN AMERICAN PROGRAMS

### U.S.-Mexico Screwworm Eradication

In 1972 governments of Mexico and the United States agreed to jointly finance and conduct a program to eradicate screwworms from Mexico north of the Isthmus of Tehuantepec. To protect northern Mexico and the United States from reinfestation, the two governments agreed to maintain a protective barrier formed by continuous release of sexually sterile screwworm flies across the 125-mile-wide Isthmus of Tehuantepec.

Thus, the threat of screwworm damage to U.S. livestock will be further removed. The cost of operating a sterile-fly barrier will be substantially reduced compared with the cost of the present barrier zone along the 2,000-mile U.S.-Mexico border. Also, Mexicans will benefit from the control and elimination of this parasite.

A plant complex for rearing, sterilization, and packaging of 300 million sterile screwworm flies per week has been built near the city of Tuxtla Gutierrez, Chiapas, in Southern Mexico. Finished in 1976, the plant provides employment for 450 Mexican production personnel.



Sterile screwworm flies from the Tuxtla Gutierrez plant are to be strategically dispersed by more than 30 program aircraft. A portion of the plant's production of sterile flies is to be airlifted in bulk to dispersion centers located in Tampico and Guadalajara for transfer to smaller aircraft and aerial dispersion over infested areas.

Sterile flies produced at the Mission, Texas, screwworm plant will continue to be dispersed over Northern Mexico to protect U.S. livestock from screwworm damage and, eventually, to aid in eradicating the pest from Mexico.

United States and Mexico field personnel located throughout Mexico work to acquaint livestock producers with the eradication program and enlist their cooperation in taking preventive measures and submitting samples of larvae collected from animal wounds.

It is estimated that it will take from 5 to 7 years to eradicate screwworms from Mexico and establish the new barrier zone.

#### Exotic Disease Programs

Since the outbreak of foot-and-mouth disease (FMD) in Mexico in 1946, the United States has recognized its vulnerability to disease introduction from its neighbors to the South. Once this FMD outbreak had been eradicated by a joint United States-Mexico effort, the two governments established a commission for the prevention of foot-and-mouth disease. In this operation, the Mexican and American Governments both contribute personnel and financial resources to a program to investigate all reports of vesicular disease, to develop and enforce Mexican Ministry of Agriculture quarantine laws to prevent the spread of FMD or the introduction of other foreign animal diseases, and to carry out an extensive FMD eradication effort, should an outbreak occur.

Since 1970, additional programs have been established in the Central American countries and Panama to assist their efforts to prevent the introduction of foreign diseases, and to prepare for their eradication should they gain entry. To meet this commitment for USDA, VS veterinarians have been assigned in Central America and Panama. Cooperative agreements have been signed with all of these countries except Guatemala.

In Panama, at its border with Colombia, the Darien Jungle has thus far prevented the highway systems of North and South America from being connected. Currently, however, plans are underway to complete the highway system through the Darien Gap. The USDA has signed agreements with Colombia and Panama to help prevent the northward spread of FMD (which is present in South America, but not in North or Central America) during construction and after completion of the highway. The joint program in Colombia is one of supervision, financial support, and advice to that governments's animal health and forestry agencies. In Panama, a joint commission has been established to provide the necessary manpower and material for the program, concentrated in the area adjacent to the Colombian border.